REINWARDTIA
Vol 12, Part 5, pp: 343 – 346

VULPIA (GRAMINEAE) IN MALESIA

Received April 14, 2008; accepted September 12, 2008

ALEX SUMADIJAYA
Herbarium Bogoriense, Botany Division, Research Center for Biology–LIPI, Cibinong Science Center, Jl. Raya Bogor Jakarta Km. 46, Cibinong 16911, Indonesia. E-mail: alexsumadijaya@gmail.com

J. F. VELDKAMP
National Herbarium of The Netherlands, Leiden University, PO Box 9514, 2300 RA Leiden, The Netherlands. E-mail: veldkamp@nhn.leidenuniv.nl

ABSTRACT
SUMADIJAYA, A. & VELDKAMP, J. F. 2009. *Vulpia* (*Gramineae*) in Malesia. *Reinwardtia* 12(5): 343–346. — A brief account of *Vulpia* (*Gramineae*) in Malesia is which consisting of *V. bromoides* and *V. myuros* is provided here, based on material seen primarily by JFV in BO, K, L, CANB.

Keywords: Malesia, *Vulpia bromoides, Vulpia myuros*

ABSTRAK
SUMADIJAYA, A. & VELDKAMP, J. F. 2009. *Vulpia* (*Gramineae*) di Malesia. *Reinwardtia* 12(5): 343–346. — *Vulpia* (*Gramineae*) yang terdiri atas *V. bromoides* dan *V. myuros* dibahas singkat, berdasarkan spesimen yang diamati oleh JFV di BO, K, L, CANB.

Kata kunci: Malesia, *Vulpia bromoides, Vulpia myuros*

INTRODUCTION

During a field trip to the Mount Gede Pangrango National Park, Kartonegoro made two collections of *Vulpia bromoides* (L.) Gray at *ca.* 2700 m asl. This species was known in Malesia from Mt. Rinjani (Lombok), Luzon (Mountain Prov.), and Mt. Wilhelm (Papua New Guinea), and it is a new generic record for Java. Previous collections suggest a rather ephemeral occurrence, but on Mt. Gede Pangrango the species appears to be well-established in the grasslands and along rivulets of the Suryakencana (*ARK 138*) and Mandalawangi meadows (*ARK 50*). How it got there is of course an enigma. It could have been introduced by local tourists, as the areas are used as camping sites. This would suggests that it occurs in similar habitats in Java.

The genus is close to *Festuca* L. and has been incorporated into it in the past. Intergeneric hybridization has been reported. However, in grasses this is generally not accepted as an argument for the merging of genera. On the contrary, recent studies have supported their generic distinctness. *Vulpia* C.C. Gmel. differs primarily by the annual habit, narrow and little-branched panicles, markedly unequal glumes, very gradually tapering and long-awned lemmas, usually 1 stamen in cleistogamous florets, and narrower caryopses.

Molecular research has suggested that *Festuca* is paraphyletic and that *Vulpia* is polyphyletic (Catalán *et al.* 2007). When split up, *Vulpia* remains distinct or as separate groups and is embedded within *Festuca s.s.* (Catalán *et al.* 2007; Charmet *et al.*1997; Inda *et al.* 2008).

VULPIA C.C. Gmel., Fl. Bad. 1: 8 (1805)

Bromus L. [unranked] *Zerna* [Panz.] Trin. in Ledeb., Fl. Altaic (1829) 110, *pro comb.* — *Festuca* L. sect. *Vulpia* (C.C. Gmel.) Endl., Gen. Pl. (1836) 101. — [*Vulpia* sect. *Euvulpia* Willk. in Willk. & Lange, Prodr. Fl. Hisp. 1 (1861) 91, *nom. inval.*]. — *Festuca* L. subgen. *Vulpia* (C.C. Gmel.) Hack. in Engl. & Prantl, Nat. Pflanzenfam. 2, 2 (1887) 75. — Type: *Vulpia myuros* (L.) C.C. Gmel.

Tufted annuals, rarely perennials. Ligules membranous. Panicles more or less secund. Spikelets shortly pedicelled, laterally compressed, disarticulating above the glumes, 3–10-flowered, uppermost floret(s) imperfect. Glumes unequal, shorter than the spikelet; lower glumes 0 or 1–nerved; upper glumes 1–3-nerved. Rachilla prolonged beyond uppermost female-fertile floret. Lemmas firmer than the glumes, not indurated, with a cuneate base, callus obtuse, glabrous, dorsally rounded, faintly 5-nerved, awns apical, straight. Anthers 1(–3). Ovary sometimes with a

ciliolate apex. Stamens usually 1. Styles 2, free to base. Lodicules 2. Caryopsis adnate to the palea, longitudinally grooved. Hilum linear. Embryo small. x = 7.

Distribution. 22 species in the temperate and subtropical Northern hemisphere; 2 species and 1 non-typical forma are introduced in Malesia.

Key to the taxa of *Vulpia* in Malesia

1a. Panicles long-exserted from the uppermost sheath, often erect, 2–9 cm long. Lower glumes 2–5.5 mm long, 0.5–0.85 times as long as the upper one (without the awn). Upper glumes 3-nerved. Lower lemmas 1.3–1.9 mm wide…..……1. *V. bromoides*

1b. Panicles enclosed by or shortly exserted from the uppermost sheath, usually curved or nodding, up to 30 cm long. Lower glumes 0.75–1.5 mm long, 0.1–0.4 times as long as the upper one (without the awn). Upper glumes 1(–3)-nerved. Lower lemmas 0.5–1.3 mm wide……..……....2

2a. Margins of lemma setose……... ……....2a. *V. myuros* f. *megalura*

2b. Margins of lemma glabrous…….. …….……..…..2b. *V. myuros* f. *myuros*

1. VULPIA BROMOIDES (L.) Gray (Fig. 1 & 2).

Vulpia bromoides (L.) Gray, Nat. Arr. Brit. Pl. 2 (1821) 124. — *Festuca bromoides* L., Sp. Pl. (1753) 75. *Festuca myuros* var. *bromoides* (L.) Wimm. & Grab., Fl. Siles. 1: (1827) 83.— *Mygalurus bromoides* Link, Enum. Hort. Berol. Alt. 1 (1821) 92. — *Vulpia myuros* var. *bromoides* (L.) Parl., Fl. Ital. 1: (1848) 419. — Lectotype: Herb. *Van Royen s.n.* (L–*912.356–219*, IDC microfiche BT-341), designated by Stace & Jarvis [Bot. J. Linn. Soc. 91 (1985) 436].

Bromus dertonensis All., Fl. Pedem. 2 (1785) 249. — *Festuca dertonensis* (All.) Asch. & Graebn., Syn. Mitteleur. Fl. 2 (1901) 559. — *Vulpia dertonensis* (All.) Gola, Malpighia 18 (1904) 365. — *Vulpia myuros* var. *dertonensis* (All.) Fiori, Nuov. Fl. Ital. 1 (1923) 142. — *Vulpia myuros* subsp. *dertonensis* (All.) Cif. & Giacom., Nomencl. Fl. Ital. 1 (1950) 42. — Lectotype: *Scheuchzer Agrostographia (1719) 290, t. 6, f. 10*, designated by Kerguélen [Lejeunia 75 (1975) 284]. Note that there may be original Scheuchzer material in W.

Culms 0.05–0.55 m tall, tufted or solitary. Ligules 0.2–0.35 mm long collar-shaped. Blades 2–12 cm X 0.2–2.5 mm, involute, glabrous, linear. Panicles 2–17 cm long, rather dense, long-exserted from the uppermost sheath, more or less erect to secund, lowermost longest branch up to half as long. Spikelets 7–11 mm long (without the awns), usually cleistogamous. Lower glumes 2.5–5.5 mm long, 0.5–0.75 times as long as the upper glumes, lanceolate. Upper glumes 5–9 mm long, linear-lanceolate, 3-nerved. Lower lemmas 6–7.5 X 1.3–1.9 mm, margin glabrous, awns 6–13 mm long, 1–2 times as long as the lemma. Stamens 1, anthers 0.5–1.7 mm long. 2*n* = 14.

Distribution. Probably originally from western Europe, introduced elsewhere; Malesia: Java (summit area Gede Pangrango), Philippines (Luzon: Pauai), Lesser Sunda Isl. (Lombok: Rinjani), Papua New Guinea: Simbu Prov. (Wilhelm).

Habitat. Damp, partly shaded and lightly trampled ground, 1980–3490 m.

Vernacular Names. Squirrel-tail or Barren fescue, Silver grass.

Notes. *Vulpia* species usually are said to be annual. However, the collection by Kartonegoro *(ARK* 138, BO, L) from the Suryakencana meadow below the summit of the Gede Pangrango has sterile shoots, suggesting a perennial. In areas without distinct seasons and with equal day lengths as in the tropics, so-called annual species may actually prove to be long-lived.

Specimens Examined. Lesser Sunda Islands, Lombok, G. Rindjani. *Anon. 9452* (BO!, L!). Papua New Guinea, Simbu Province, Mt. Wilhelm. *ANU 15301 (J.M.B. Smith)* (CANB!, L!); *ANU 15518 (J.M.B. Smith)* (CANB!, L!). Java, Gunung Gede Pangrango National Park, Pangrango summit, Mandalawangi meadow, *Kartonegoro ARK 50* (BO!); Gunung Gede Pangrango National Park, Suryakencana meadow. *ARK 138* (BO!, L!).

2. VULPIA MYUROS (L.) C.C. Gmel.

Culms up to 0.5 m tall, tufted or solitary. Ligules 0.2–0.5 mm long, collar-shaped. Blades 2–15 cm X 0.3–3 mm, usually involute, stiff to flaccid, glabrous, linear. Panicles 5–35 cm long, lax to dense, enclosed by or shortly exserted from the uppermost sheath, usually curved or nodding, lowermost longest branch usually many times shorter. Spikelets 6–10 mm long (without the awns), usually cleistogamous, with 2–5 fertile florets and 1 or 2 distal sterile florets. Callus rounded, glabrous. Lower glumes 0.7–1.5 mm long, 0.2–0.45 times as long as the upper glumes, lanceolate. Upper glumes 3.5–5 mm long, linear-lanceolate, 1(–3)-nerved. Lower lemmas 5–7 X 0.5–1.3 mm, margins glabrous or setose, awns 8–16 mm long, 1.7–2 times as long the lemma.

Stamen 1, anthers 0.3–1 mm long. 2*n* = usually 42.

Notes. Three lemma indument types exist, which specialists distinguish as distinct taxa, even when mixed populations have been reported. Two of these occur in Malesia. We believe that these taxa should be recognized as forma since there is information on the population genetic structure.

One or another of these have been cultivated in Lawang, East Java, by Buysman [Teysmannia 23 (1912) 768], but has not been collected again.

2a. VULPIA MYUROS FORMA MEGALURA (Nutt.) Stace & R. Cotton, Watsonia 11 (1976) 72.

Festuca megalura Nutt., J. Acad. Sci. Philadelphia II, 1 (1848) 188. — *Vulpia megalura* Rydb., Bull. Torrey Bot. Club 36 (1909) 538. — *Vulpia myuros* var. *megalura* Auquier, Bull. Jard. Bot. État 47 (1977) 123. — *Vulpia myuros* subsp. *megalura* Soják, Cas. Nár. Mus., Odd. Prír. 148 (1980) 77. — Type: U.S.A. California. Santa Barbara, *Gambel s.n.* (PH - Holo; US-556190 fragm. & photo ex PH - Iso).

Diagnose. Margins of lemma setose.

Distribution. Europe, naturalized elsewhere, *e.g.* in Malesia: Philippines (Luzon: Benguet).

Habitat. Open grasslands, fields, locally dominant, 1400–2300 m alt.

Uses. Weed, also used as a forage grass.

Vernacular Name. Foxtail fescue.

Specimen Examined. Philippines, Luzon, Benquet Province, Pauai, *BS 31913 Santos* (BO!, K, L!); *Santos, J.V. 7540* (L!).

2b. VULPIA MYUROS FORMA MYUROS, Fl. Bad. 1 (1806) 8.

Festuca myuros L., Sp. Pl. (1753) 74. — *Zerna myuros* Panz. [Denkschr. Königl. Akad. Wiss. München 4 ('1813', 1814) 297 (comb. not made)] ex B.D. Jacks., Index Kew. 2 (1895) 1249. — *Distomomischus myuros* Dulac, Fl. Hautes-Pyrénées (1867) 91. — Lectotype: *Herb. Van Royen s.n.* (L, holo, *sh. 912. 356-218*, IDC microfiche BT-341), designated by Stace & Jarvis [Bot. J. Linn. Soc. 91 (1985) 436].

Diagnose. Margins of lemma glabrous.

Distribution. Europe, naturalized elsewhere, *e.g.* in Malesia: Sabah (Kinabalu), Lesser Sunda Isl. (Timor Leste: Tatamailau), Philippines (Luzon: Benguet).

Habitat. Open grasslands, fields, reported for 2000 m in Sabah.

Uses. Sometimes used as a forage grass.

Vernacular Name. Rat's-tail fescue.

Specimens Examined. Lesser Sunda Island, Timor Leste, G. Tatamailau, *Rao et al. 90* (herbarium not noted); Sabah, Kinabalu, *SAN 151258 (Laegaard)* (AAU, L !, SAN).

ACKNOWLEDGEMENT

The authors would like to thank Abdulrokhman Kartonegoro (BO) as the collector, Man and the Biosphere (MAB) Indonesia for supporting the expedition to Gunung Gede Pangrango National Park. Also Helena Duistermaat (L) and Paul M. Peterson (US) for reviewing and give valuable corrections.

REFERENCES

CATALÁN, P., TORRECILLA, P., LÓPEZ-RODRÍGUEZ, J.A., MÜLLER, J. & STACE, C.A. 2007. A systematic approach to subtribe *Loliinae* (*Poaceae: Pooideae*) based on phylogenetic evidence. *Aliso* 23: 380–405.

CHARMET, G., RAVEL, C. & BALFOURIER, F. 1997. Phylogenetic analysis in the *Festuca-Lolium* complex using molecular markers and ITS rDNA. *Theor. Appl. Genet.* 94 (8): 1038–1046.

INDA, L.A., SEGARRA-MORAGUES, J.G., MÜLLER, J., PETERSON, P.M. & CATALÁN, P. 2008. Dated historical biogeography of the temperate *Loliinae (Poaceae, Pooideae)* grasses in Northern and Southern hemispheres. *Mol. Phylogen. Evol.* 46: 932–957.

Figure 1. *Vulpia bromoides* (L.) Gray

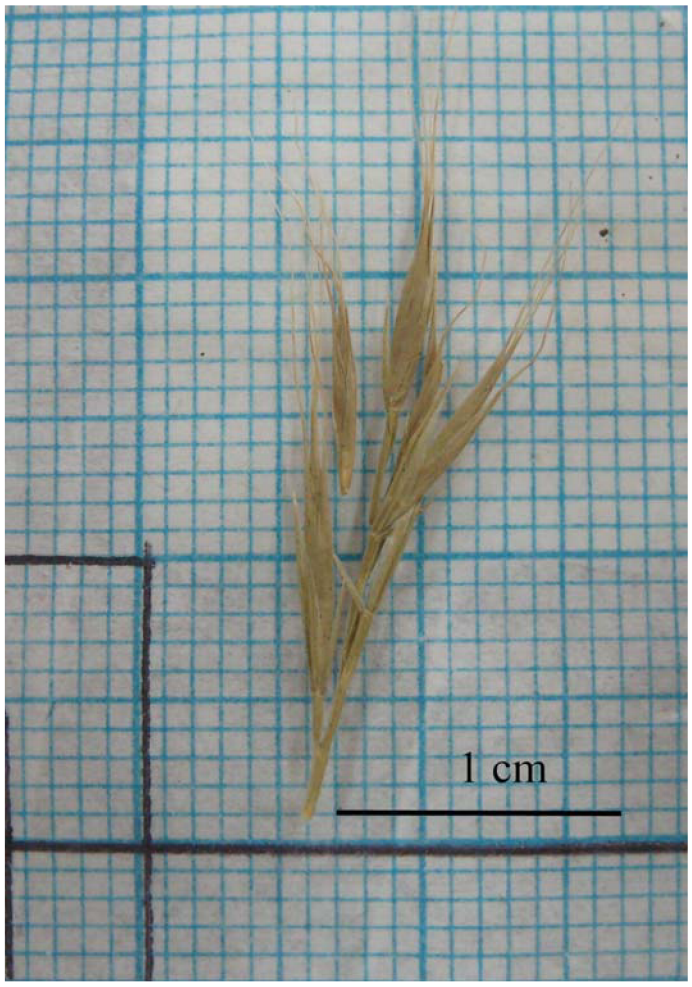

Figure 2. Spikelet *Vulpia bromoides* (L.) Gray